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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,047	12/31/2003	Randy Dale Curry	42173-017	2279

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HUSCH & EPPENBERGER, LLC  
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ST. LOUIS, MO 63105-3441

EXAMINER

CHN, BRAD Y

ART UNIT PAPER NUMBER

1744

DATE MAILED: 01/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/750,047

Applicant(s)

CURRY ET AL.

Examiner

Brad Y. Chin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/31/03, 9/22/04, 11/05/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 50-58 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 50-58 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/8/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

DETAILED ACTION

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 50-53 and 57-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over the non-patent literature, Bayliss et. al., "The Combined Effect of Hydrogen Peroxide and Ultraviolet Irradiation on Bacterial Spores", Journal of Applied Bacteriology 47:263-269 (1979) in view of Blidschun et. al. [U.S. Patent No. 4,680,163].

Regarding claim 50, Bayliss teaches a method of decontaminating a contaminated surface, the method comprising:

applying a photosensitizer [a commonly known photosensitizer] onto the contaminated surface and illuminating the sprayed surface with light to cause chemical reactions to decontaminate the surface (See p. 263 – ultraviolet [light] irradiation of spores of *Bacillus subtilis* in the presence of hydrogen peroxide produces a rapid kill which is up to 2000-fold greater than that produced by irradiation alone).

Bayliss fails to teach that the method of decontaminating a contaminated surface comprises spraying the photosensitizer onto the contaminated surface of a person-occupiable space, in an environment open to the person-occupiable space. Bayliss also fails to teach that the photosensitizer is electrically charged.

Blidschun teaches the use of a sterilizing agent, hydrogen peroxide, which is ultrasonically atomized to form a mist, e.g. for spraying, charged and subsequently directed to, e.g. spraying, the [contaminated] surface to be sterilized by an electrostatic field. The electrostatic field causes the exceedingly small charged droplets, which form the mist of the sterilizing agent to be conveyed to the surface (See Specification, col. 2, line 58 to col. 3, line 13).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blidschun with Bayliss because Bayliss teaches the effectiveness of illuminating a photosensitizer, such as hydrogen peroxide, with ultraviolet light for killing bacteria spores on contaminated surfaces. Incorporating the method of spraying an electrically charged photosensitizer from Blidschun into Bayliss would allow one of ordinary skill in the art to apply and provide for adherence of the photosensitizer onto the contaminated surface. Additionally, it would have been obvious to one of ordinary skill in the art to apply such an electrically charged photosensitizer to surfaces, such as people, their garments, equipment, and person-occupiable spaces, e.g. chairs, tables, etc., in an environment open to the person-occupiable space to decontaminate bacteria spores that may have contaminated these surfaces.

Regarding claim 51, Bayliss teaches the method of decontaminating a contaminated surface where the photosensitizer is a solution (See p. 264 – 0.1M sodium phosphate buffer pH 7.0 and up to 2.5 g hydrogen peroxide/100 m), and the step of spraying the photosensitizer onto

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the contaminated surface comprises electrically charging at least one component of the solution (applying Blidschun's teaching and electrically charging the hydrogen peroxide component of the solution – See explanation above).

Regarding claim 52, Bayliss further teaches the method of decontaminating a contaminated surface further comprising controlling the temperature of the sprayed photosensitizer to enhance the formation rate, mobility, or the decontaminating activity of the photo-products and their ensuing reactions (See p. 264 – sample temperatures were controlled by heating to 85°C and cooling in ice for at least 5 minutes).

Regarding claim 53, Bayliss further teaches the method of decontaminating a contaminated surface where the photosensitizer includes hydrogen peroxide (See p. 263 – ultraviolet [light] irradiation of spores of *Bacillus subtilis* in the presence of hydrogen peroxide – a common photosensitizer; See Applicant's Specification, p. 7, lines 5-9 – produced a rapid kill which was up to 2000-fold greater than that produced by irradiation alone).

Regarding claim 57, Bayliss further teaches the method of decontaminating a contaminated surface where the light includes light of wavelengths between about 200 nm and about 320 nm (See p. 263 – ultraviolet irradiation of the spores at wavelengths 254 nm).

Regarding claim 58, Blidschun teaches the method of decontaminating a contaminated surface where the photosensitizer includes carrier particles (See Specification, col. 4, lines 29-31 – the mist formed by the ultrasonic agitation of the liquid sterilizing agent is entrained in a stream of air or other suitable carrier gas, i.e. carrier particle for aiding in the application of and dispersion [spraying] of the electrically charged photosensitizer onto the contaminated surface).

2. Claims 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over the non-patent literature, Bayliss et. al., "The Combined Effect of Hydrogen Peroxide and Ultraviolet

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Irradiation on Bacterial Spores", Journal of Applied Bacteriology 47:263-269 (1979) in view of Blidschun et. al. [U.S. Patent No. 4,680,163] and further in view of Clark et. al. [U.S. Patent No. 5,925,885].

Regarding claim 54, Bayliss and Blidschun teach the method of decontaminating a contaminated surface according to claim 50 above. Bayliss and Blidschun fail to teach the step of illuminating the sprayed surface with a continuous beam.

Clark teaches a method for sterilizing microorganisms using pulses of light for deactivating microorganisms within a target object. Clark teaches that although a continuous beam is possible to sterilize microorganisms, the high intensity of these pulses of light results in a unique bacterial effect not observed when the same energy is provided at low intensity in sustained or continuous wavelength applications [of ultraviolet light] (See Specification, col. 11, lines 18-22). Accordingly, Clark teaches that the step of illuminating the sprayed surface could be carried out with a continuous beam of ultraviolet light.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Clark with Bayliss and Blidschun because it would have been obvious to provide a continuous beam of ultraviolet light to illuminate the electrically charged photosensitizer on the contaminated surface. Without undue experimentation, one skilled in the art would have known that pulsed light would be more effective in killing bacteria spores; though, continuous light would kill bacteria spores, just not as effectively.

Regarding claim 55, it accordingly would have been obvious that combining the teachings of Clark with Bayliss and Blidschun would further define the step of illuminating the sprayed surface with light having a wavelength between about 200 nm and about 320 nm (See explanation for claim 57 above).

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3. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over the non-patent literature, Bayliss et. al., "The Combined Effect of Hydrogen Peroxide and Ultraviolet Irradiation on Bacterial Spores", Journal of Applied Bacteriology 47:263-269 (1979) in view of Blidschun et. al. [U.S. Patent No. 4,680,163] and further in view of Bowing et. al. [U.S. Patent No. 4,051,058].

Bayliss and Blidschun teach the method of decontaminating a contaminated surface according to claim 50 above. They fail to teach the photosensitizer including a surfactant.

Bowing teaches a stable peroxy-containing concentrate [also known as suitable photosensitizers] for the production of microbicidal agents characterized by a content of 0.5% to 20% by weight of a peracid [known photosensitizer], 25% to 40% by weight of hydrogen peroxide [known photosensitizer] – which have long term effects on disinfecting most microorganisms (See Specification, col. 3, lines 30-35), and other constituents (See Specification, col. 1, lines 50-58). Bowing further teaches that the stable peroxy-containing concentrate contains alkylbenzene sulfonates or alkyl sulfates (See Specification, col. 3, lines 46-53), e.g. surfactants.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Bowing with Bayliss and Blidschun because it is well known that surfactants aid in the dispersion and coating of surfaces when applying photosensitizers. Because the intention of Bayliss and Blidschun are both to provide for the adhesion of a photosensitizer, one that is electrically charged in the case of Blidschun, it would have been obvious for one of ordinary skill in the art to aid the dispersion and coating of a photosensitizer onto a contaminated surface by including a surfactant as taught by Bowing into the photosensitizer.

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**Conclusion**


4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brad Y. Chin whose telephone number is 571-272-2071. The examiner can normally be reached on Monday – Friday, 8:00 A.M. – 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Warden, can be reached at 571-272-1281. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

byc  
December 23, 2004

  
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